

## WHAT IS CLAIMED IS

1. A variable optical equalizer interposed in an optical fiber forming an optical transmission line,  
5 comprising:

an input-side fiber collimator which emits in the form of a beam signal light transmitted over the optical fiber;

an output-side fiber collimator which causes the  
10 optical fiber to transmit the signal light input in the form of a beam; and

a variable Faraday rotator and a polarization dependent element which are disposed on an optic axis extending between the input-side fiber collimator and  
15 the output-side fiber collimator.

2. A variable optical equalizer according to claim 1, further comprising:

a birefringent plate which separates by polarized  
20 wave a beam of light emitted from the input-side fiber collimator, into two beams of light;

a  $\lambda/2$  wave plate which causes the separated two beams of light to have the same direction of polarization for input to the polarization dependent element;

25 a  $\lambda/2$  wave plate which causes the direction of polarization of the two beams of light emitted from the polarization dependent element to be orthogonal to each

other; and

a birefringent plate which combines the two beams of light whose directions of polarization are caused to be orthogonal to each other, into a single beam of light for input to the output-side fiber collimator.

3. A variable optical equalizer according to claim 1, wherein the variable Faraday rotator is disposed both at the input and at the output of the polarization dependent element.

4. A variable optical equalizer according to claim 2, wherein the  $\lambda/2$  wave plate intervenes in the two beams of light separated by polarized wave.

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5. A variable optical equalizer according to any one of claim 1, wherein the polarization dependent element is a birefringent plate.

20 6. An optical multiplex transmission system combining a multiplicity of light signals each having a different wavelength, for transmission over a single optical fiber, the optical multiplex transmission system comprising a variable optical equalizer according to  
25 any one of claims 1 to 5, for compensating for transmission characteristics of signal light on a wavelength-by-wavelength basis.